

B R E V I O R A

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A NEW PHYLLOCARID CRUSTACEAN FROM THE UPPER DEVONIAN OF OHIO

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INTRODUCTION

When curating the collections of non-trilobite arthropods in the Museum of Comparative Zoology, the writer recently found a fossil crustacean which had been sent to Professor P. E. Raymond for determination. The specimen was received from the Cleveland Museum of Natural History through Dr. D. H. Dunkle in January 1944; the late Professor Raymond published no description of the specimen and left no manuscript notes with it. Recent collecting in the same area by Mr. G. Lammers of the Cleveland Museum failed to find further specimens, although a fragment of a second specimen from a different locality was recently donated to the Museum of Comparative Zoology by Mr. R. Pritschan of Cleveland. This specimen will be referred to as the MCZ specimen to distinguish it from the original Cleveland Museum specimen.

During the preparation of this description Mr. Lammers called the writer's attention to the fact that H. K. Brooks of the University of Florida had collected and studied the echinocaridids of this region. In correspondence, Mr. Brooks informed the writer that he had photographed this specimen some years ago, but was kind enough to allow the writer to submit this account for publication.

The writer is indebted to Dr. G. A. Cooper, Professor A. La Rocque and Professor F. G. Stehli for searching through the collections at the U. S. National Museum, the Ohio State University and Western Reserve University, Cleveland, for additional material, and to Mr. W. E. Scheele, Director of the Cleveland Museum of Natural History, for allowing the specimen to be retained for description. Professor H. B. Whittington kindly took the photograph for Plate 1 and offered helpful criticism of the manuscript.

SYSTEMATIC DESCRIPTION

Subclass MALACOSTRACA Latreille, 1806

Superorder PHYLLOCARIDA Packard, 1879

Order ARCHAEOSTRACA Claus, 1888

Suborder RHINOCARINA Clarke *in* Zittel-Eastman, 1900

Family OHIOCARIDIDAE fam. nov.

Diagnosis. Carapace valves deep, with anterodorsal-medio-ventral fold and broad median dorsal plate. Rostral plate and number of thoracic and abdominal segments unknown.

Remarks. The family Rhinocarididae comprises five genera which form a compact group characterised by elongate carapace valves and a narrow median dorsal plate. The present genus is so distinct from the previously described Rhinocarina as to warrant the erection of a second family.

Genus OHIOCARIS gen. nov.

Type species. *Ohiocaris wycoffi* sp. nov.

Diagnosis. As for the family.

OHIOCARIS WYCOFFI sp. nov.

Plate 1; Figure 1

Description. The Cleveland specimen is exposed with the dorsal surface of the carapace uppermost in one half of a concretion. It is preserved as a very thin film of golden brown ?cuticular material, but this has been destroyed over much of the specimen so that an internal mould is revealed. The concretion has been split apart so that the two carapace valves and median dorsal plate are separated by matrix from two complete abdominal segments, a fragment of a third, and stylet fragments. The whereabouts of the counterpart of the concretion are unknown.

As may be seen from Figure 1 and Plate 1, the carapace valves are deep; a well-defined fold, semicircular in cross section, runs from the anterodorsal region of each carapace valve, immediately posterior of the strong carapace horn, and dies out ventrad of the centre of the valve. The ventral or free margin of each valve is bordered by a narrow reflexed rim except in the mid-ventral region, where it continues as a marginal ridge inside the ventral margin.

The broad median dorsal plate is separated anteriorly from the cephalic region of the carapace by a shallow transverse groove. The grooves laterally separating the plate from the main area of the carapace valves are narrower and deeper than the anterior groove, and are confluent posteriorly with the carapace

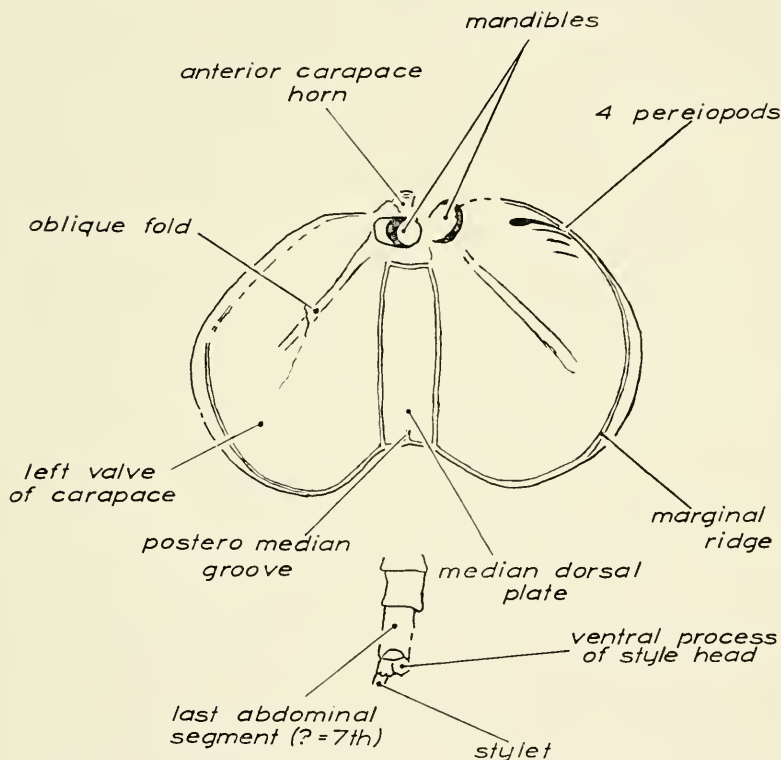


Figure 1. Outline drawing of *Ohiocaris wycoffi* gen. et sp. nov. showing structures visible on Plate 1. Cleveland Museum of Natural History 33241. x 1.1.

rim and a groove marking the posterior edge of the median dorsal plate. These grooves doubtless mark the position of marginal rims analogous in structure to those at the ventral edge of the carapace valves. The plate bears a faint posteromedian groove which extends anteriorly for 1.4 mm.

The carapace valves and median dorsal plate are crazed by

veinlets of a brown mineral (?collophane), whereas the abdominal segments and the matrix are unaffected, indicating differential chemical desiccation. The fragments of test preserved are smooth and free from ornament and the few wrinkles present are clearly secondary.

The abdominal segments are inverted relative to the carapace and thus the style and stylets are exposed ventral side uppermost. The last segment (?7th) is 1.3 times the length of the preceding segment and has a concave posteroventral margin. After the photograph for Plate 1 was taken, the fragmentary style and stylets were broken from the matrix. The dorsal head of the style thus exposed was found to be of the echinocaridid type illustrated by *Echinocaris sublevis* Whitfield, 1880, figure 6 (=Hall and Clarke, 1888, pl. 29, fig. 13). Only the bases of style and stylets are preserved but the former is triangular in cross section and much shorter than the stylets. As in all the known archaeostracans, the head of the style embraces the proximal portions of the stylets laterally and ventrally. A small denticle, 0.2 mm. long by 0.4 mm. broad, projects posterolaterally from the right lateral edge of the ventral style process or platform.

The cuticle of the style head, stylets and abdominal segments lacks ornament.

Only the inflated coxal parts of the mandibles are preserved, and excavation has failed to reveal the toothed gnathal lobes which were probably broken off at burial. The mandibles have been impressed through the anterodorsal region of the carapace valves, and the plane of section shows the left mandible to have had a wall thickness of 0.7 mm.

At least four recurved ridges on the anteroventral region of the carapace fairly certainly mark the position of simple pereopods. As they are only seen as impressions through the thin cuticle of the carapace no detail of their structure can be discerned.

The MCZ specimen is a fragment showing the median dorsal plate only.

Dimensions, in millimeters

Cleveland Museum of Natural History 33241	
Maximum length of undistorted right carapace valve	34.0
Maximum height of undistorted right carapace valve, to right edge of groove bordering median dorsal plate	25.0

Length of median dorsal plate, along mid-line	21.0
Maximum width of median dorsal plate, at a point 7 mm. posterior from transverse groove	7.3
Length of penultimate abdominal segment	4.3
Length of last abdominal segment	5.5
Maximum dorsal width of style head	4.5
Length of style head to base of style	3.3
Width of style at base	1.1
Cross-sectional diameter of stylet	1.6

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Maximum length of median dorsal plate	ca. 21
Maximum width of median dorsal plate	7.2

Holotype. Cleveland Museum of Natural History 33241. Collected by Dale Wycoff, 25th May, 1934, from the Chagrin Shale, Upper Devonian. Locality — shore of Lake Erie at mouth of Porter Creek, 12 miles west of Cleveland, Cuyahoga County, Ohio.

Other material. Museum of Comparative Zoology 6556. Collected by Raymond Pritschan and donated to the Museum via G. Lammers, July 31, 1961; found as float from Chagrin Shale. Locality — Painesville, 25 miles northeast of Cleveland, Lake County, Ohio (? Whitfield's 1880, p. 37, Leroy locality).

Remarks. The spread out carapace valves of the Cleveland specimen recall the condition in *Dithyrocaris*, which possibly lived with the valves in this attitude. The marginal rim fore-shadows the well-developed submarginal wall and double structure of *Dithyrocaris*, and is similar to the condition in the ceratiocaridids *Caryocaris curvilata* (Gurley) and *Callizoe bohémica* Barrande. The anterodorsal-medioventral fold is more anteriorly situated than that of *Pephricaris horripilata* Clarke, whereas the "Schrägrippe" and "Schnabelfurche" of *Silesicaris nasuta* Gürich (1929, p. 29) run closer to the ventral margin. As mentioned above, the style resembles that in *Echinocaris* rather than that in any rhinocaridid, but the long smooth last abdominal segment is different from that of every species of that genus.

The posteromedian groove on the median dorsal plate may prove to be of phylogenetic significance as a vestige of the non-rhinocaridid simple dorsal hinge, and homologous with the median fold of other members of the Rhinocarina. *Ohiocaris* shows the greatest development of the median dorsal plate and suggests a derivation from the Middle and early Upper Devonian rhinocaridids. Thus the plate width/carapace width ratio is 0.146 in

Ohiocaris, but only 0.096 in the specimen of *Elymocaris siliqua* figured by Beecher (1902, pl. 19, fig. 8; Yale Peabody Museum 22410). Hall and Clarke's reconstruction of *Mesothyra occani* (1888, pl. 32, fig. 1) is inaccurate in showing the hypothetical median dorsal plate too broad. Measurement of the specimen upon which this reconstruction was based (New York State Museum 4576) shows that the ratio is 0.073, not 0.150 as figured. Two other specimens of *M. occani* (NYSM 4577, 4581) give comparable ratios of 0.093 and 0.082, and in the *Rhinocaris columbina* figured by Clarke (1893, fig. 4, NYSM 4786) the ratio is only 0.074.

The concretion in which the Cleveland specimen occurs has the characteristic orange colour of oxidised Chagrin material described by Cushing, Leverett and Van Horn (1931, p. 34). Fossils do not seem to have been recorded previously from the Chagrin west of Cleveland (Cushing *et al.*, 1931, p. 35). The MCZ specimen forms part of a small collection comprising many of the same species of brachiopods and pelecypods as those listed by Cushing *et al.* (1931, p. 35), and in addition the crustaceans *Echinocaris multinodosa* Whitfield, *E. sublevis* Whitf. and *Palacopalacmon newberryi* Whitf..

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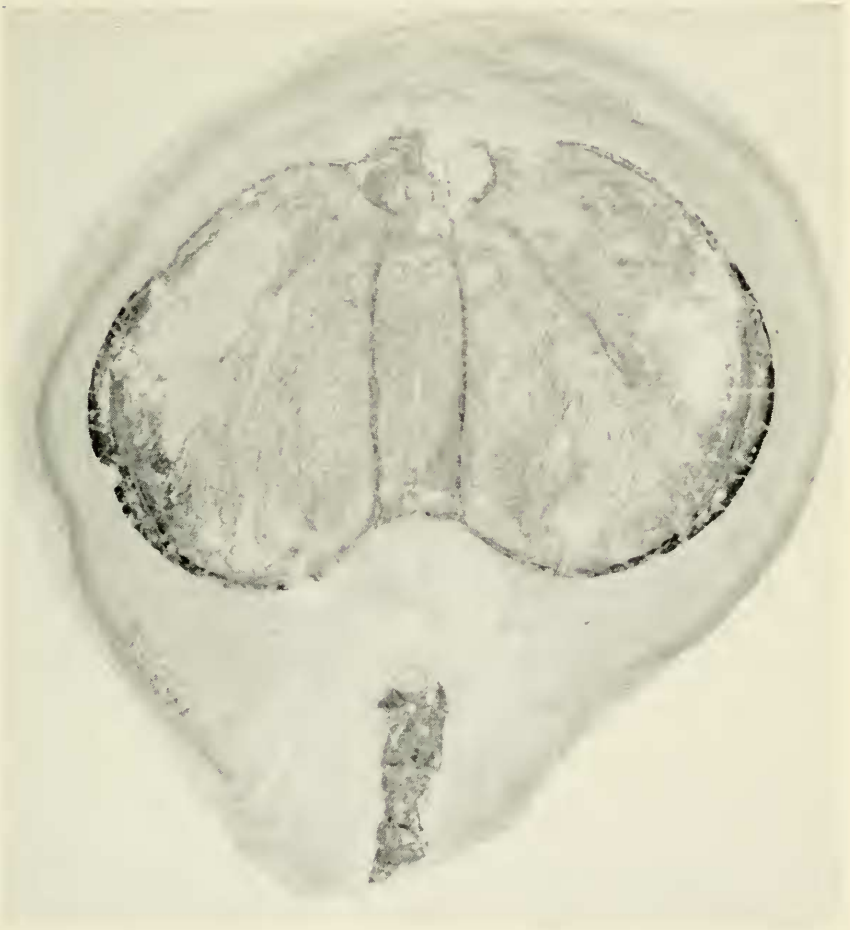


Plate 1. *Ohiocaris wycoffi* gen. et sp. nov., Cleveland Museum of Natural History 33241, x 1.7.